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MUNICIPAL SANITATION IN WASHINGTON AND BALTIMORE.

IN an introductory article upon the sanitary condition and organization of American cities, published in *THE FORUM* for May, it was stated that the subject would be continued in special studies of a few of our large cities, so far as data were available for the purpose. In this paper it is proposed to give some account of Washington and Baltimore from this point of view.

These cities have been made the subject of a special report to the Superintendent of the United States Census, by whose permission certain data contained therein are used in this comparison, and they present certain resemblances and certain differences, which make the results of the examination particularly interesting from a sanitary point of view. Both cities have a comparatively large proportion of colored population, considerable differences in altitude in different localities, an abundant and good general water-supply, and active Health Departments. The climatic conditions are nearly the same for each, but Washington is a sewered city and Baltimore is not.

On June 1, 1890, Washington (including Georgetown) had a population of 202,978, occupying 34,543 dwellings, on 6,550 acres of ground, of which 3,348 acres were actual building-area. There were, therefore, 10.32 dwellings, each containing an average of 5.88 persons, to each acre of building-area, or 60.63 persons an acre of such area. At the same time Baltimore had a population of 434,439, living in 72,112 dwellings in 18,867 acres, of which 11,349 acres were actual building-area. There were, therefore, to each acre of building area, 6.35 dwellings, each containing an average of 6.02 persons, or 38.28 persons an acre of building-area. Between 1888 and 1890 the number of dwellings increased about sixty-one per cent in Washington and forty-two per cent in Baltimore (to which last a considerable addition of territory was made in the interval); the average number of persons to a dwelling diminished in Washington from 6.11 to 5.94, and in Baltimore from 6.54 to 6.02; while the average number of persons to a family increased from 4.98 to 5.24 in Washington, and fell from 5.08 to 5.01 in Baltimore.

Washington is the more densely populated of the two, if only actual building-area is considered, but it has fewer tenement-houses, a less average number of persons to the dwelling and a relatively greater amount of open area in the form of streets and parks; having two hundred and thirty miles of streets, averaging one hundred feet in width, and five hundred and thirty-eight acres of parks; while Baltimore has seven hundred and eighty miles of streets, averaging sixty-six feet in width, and eight hundred and sixty-six acres of parks. In Washington the average daily supply of water to each person is 177 gallons; in Baltimore it is ninety-two gallons; while for each thousand persons there are in Baltimore 4.37 drinking saloons, and in Washington, 3.01. A greater proportion of the persons doing business in Baltimore live outside the city limits than is the case in Washington, as is shown by the fact that during the ten years, 1880-90, the average number of commuters in suburban travel on railroads was annually for Baltimore, 719,082, and for Washington, 290,830. Washington had two hundred and fifty-five miles of sewers, but a considerable number of dwellings was not connected with them. Baltimore had theoretically no sewers, and the greater part of its sewage is disposed of in cesspools, vaults and boxes.

During the period of six years ending June 1, 1890, the average annual death-rate in the District of Columbia was 23.41 a thousand of mean population, or a little over one a thousand greater than that of Baltimore, which was 22.39 for the same period; but this excess of mortality was entirely due to the higher death-rates of the colored population, which were 33.25 for the District and 32.60 for Baltimore, while those for the white were 18.55 for the District, and 20.41 for Baltimore, still-births being excluded in each case.

The best means of comparing the healthfulness of two different localities, so far as this is indicated by the tendency to death in the population of these localities, is by means of a life-table, and the expectation of life deduced therefrom;—because such a table eliminates, as far as possible, the differences in mortality due to different distribution of sex and age in the two populations which are to be compared. From approximate life-tables calculated for the two localities under consideration, we find that in the District of Columbia, if a million white children had been born on June 1, 1889, there would have been 506,626 males and 493,374 females. If now these infants were subjected to the same influences tending to produce death for a series of years as were acting on the general population

during the census year, at the end of the first year there would have survived of the white male infants, 400,512; at the end of the fourth year, 361,351; at the end of the twenty-fourth year, 320,502; and at the end of the forty-fourth year, 247,323; while out of a million colored infants under the same conditions, 500,725 would have been males, of whom 293,318 would be surviving at the end of the first year; 219,565 at the end of the fourth year; 168,448 at the end of the twenty-fourth year; and 109,724 at the end of the forty-fourth.

Making similar computations for the females and also for Baltimore, we find that in the District of Columbia the expectation of life, or mean after-life time of a white male infant at birth, is 39.20; for a white female, 44.47 years; for a colored male infant, 20.16, and for a colored female infant, 23.91; while in Baltimore, the expectation of life of a male white infant at birth is 37.01; of a female infant, 40.33; of the colored male infant, 19.26 and of the female, 24.40 years. The expectation of life of a white male infant, therefore, in the District of Columbia is two years greater than it is in Baltimore; of a white female infant, a little over four years greater in the District of Columbia than it is in Baltimore; of a colored male infant at birth not quite a year greater in the District of Columbia than in Baltimore; and of a colored female infant, slightly less in the District than in Baltimore.

These great differences between the expectation of life of the white and colored infants become rapidly less with advancing years. At the beginning of the fifth year of life, the expectation of life of a white male child in the District of Columbia is 49.56; in Baltimore it is 51.03. Of the colored male at the same age, it is in the District of Columbia 39.80 and in Baltimore, 43.24. At the beginning of the twenty-fifth year of life, the expectation of life of the white male in the District of Columbia is 34.50 years; in Baltimore 35.82; and of the colored male in the District, 28.64; in Baltimore, 30.53. At the commencement of the fifty-fifth year of age, the expectation of life of the white male in the District is 16.23; of the colored male, 13.67; in Baltimore, of the white male, 16.81; of the colored male, 13.88. From these figures it would seem that Baltimore is more unhealthy than Washington for infants, but that for persons five years old and upwards the expectation of life is greater in Baltimore than in Washington.

The aggregate death-rates have upon the whole been diminished both in the District of Columbia and in Baltimore during recent

years. In 1875 the death-rate of the District of Columbia was 26.90, from which it diminished steadily until 1881, when it was 22.69, since which time it has varied slightly, sinking to 21.89 in 1887, after which it has again increased. In Baltimore the death-rate in 1875 was 24.55. It sank to 21.16 in 1878, rose to 26.05 in 1883, owing to the small-pox epidemic, and reached its lowest point (20.58) in 1889, rising to 23.47 in 1890.

In studying death-rates as indications of the healthfulness of a city, it is very desirable to know, not merely the gross death-rates, but those of different parts of the city. In the District of Columbia these rates vary for the whites from 39.30 in one locality and 32.00 in another to 15.71 and 14.94 in other parts of the city, not taking into account the suburban districts, in one of which the rate was as low as 10.01; while the colored death-rates vary from 66.00 and 55.56 to 26.32 and 32.47, falling as low as 25.52 in one of the rural districts. In Baltimore the range of variation is still greater, being for the whites from 96.37 and 50.94 to 12.26 and 9.85, and for the colored from 400.00 and 333.33 to 12.26 and 14.34.

It is evidently a matter of great interest to determine as far as possible the conditions which give rise to these great differences of death-rates in different parts of a city, but it is a difficult matter; because these causative conditions are many and various, and it cannot be effected by the purely statistical method of research, because the obtainable data are imperfect, and more or less inaccurate, and because temporary and local conditions cannot be sufficiently taken into account by it. The value of such statistics by districts in a city is mainly to indicate the localities where it is most probable that special causes of sickness and death exist, and where a special investigation of the locality by some one familiar with its topography and peculiarities, is most likely to lead to good results.

The variations in death-rates which depend upon differences in the race, age, sex and occupation distribution of the population in different localities, may be to a considerable extent ascertained by statistics, but these will serve only as a basis for special inquiries into the more immediate causes, such as the poverty and ignorance of the people, dampness or pollution of the soil, the nature of the water-supply, house-drainage and sewage-disposal, the presence of dangerous collections of filth, and the action of epidemic forms of disease. The marked differences between the mortality of the white and of the colored race which appear both in the District of Columbia and

in Baltimore, are also found in almost all Southern cities; and it is an interesting question as to how far they are due to differences in the physical structure of the two races, and how far to differences in the character and place of residence, the food, the occupations, or the habits and modes of life of these two races. It is evident that the higher mortality of the colored race is mainly, though not entirely, due to the excessively high death-rate among the young children. For example, in the District of Columbia, the average annual death-rate for six years among the colored children under five years of age was 187.20; while among the whites it was 74.92. In Baltimore City the corresponding figures for the colored were 197.62, and for the whites, 88.22; that is, in both cities, the death-rate of the colored children under five was more than twice that of the white.

Even among the whites, there is a perceptible relation between the mortality and race-differences, although it is not nearly so marked. For example, among the white married males between fifteen and forty-five years of age in the District of Columbia, the death-rate of those born of American mothers was 6.75; of those born of Irish mothers, 13.61; and of those born of German mothers, 12.63. The corresponding rate in Prussia for 1885 was 10.13. For white married males forty-five years and upwards, the death-rate for those born of American mothers was 22.06; for those born of Irish mothers, 42.06; for those born of German mothers, 33.48—the corresponding figures for Prussia for 1885 being 32.83. And in general the death-rates of white persons whose mothers are of American birth appear to be less than those of persons of Irish or German descent; but here also it is doubtful as to whether this is due to physical differences between the different races, or to different places and modes of life depending upon poverty, *etc.*

Some interesting relations between the average altitude of the different sub-districts in Washington and Baltimore and their average annual death-rates are brought out by the statistics for the six years ending June 1, 1890. Thus in the District of Columbia, the death-rates diminished with considerable regularity with the increasing average altitude of the locality, ranging from 34.99 and 30.21 in the districts having an average altitude of only ten or twelve feet above high-water mark to between 19 and 20 a thousand in the districts having an average surface level of over one hundred feet above high-water mark—the diminution being chiefly marked in the number of deaths from malarial fever, consumption and diarrhoeal disease.

Similar differences are found also in Baltimore. Thus for the districts whose surface is under twenty-five feet average altitude above high-water mark, the aggregate death-rate is 26.13; for those upon an altitude of from twenty-five to fifty feet, it is 23.69; for those from fifty to seventy-five feet, 23.48; for those from seventy-five to one hundred feet, 19.70, and for those having an altitude of one hundred feet and upwards, it is 19.35. For the same groups of districts, the death-rates from malarial fever a thousand of mean population are, under twenty-five feet, 70.59; from twenty-five to fifty feet, 46.59; from fifty to seventy-five feet, 31.41; from seventy-five to one hundred feet, 26.45; and one hundred feet and upwards, 24.80.

But it is in the low-lying, water-side districts that are found some of the poorest class of people. Thus in the district in Washington having the highest death-rate among the whites (37.63) and a very high death-rate among the colored (44.87), the average altitude was only twenty-six feet, the houses were mostly small frames, there was much vacant ground, much of which had been used as a dumping-place for rubbish. In this district, malarial fevers caused more than five times the average proportion of deaths, and the mortality from typhoid fever, diarrhoeal diseases and consumption was also excessive, while that from diphtheria was unusually low. On the other hand, the district having the lowest death-rate among the whites (12.43) had an average altitude of eighty-nine feet, the houses were of the better class, and no special nuisances were present.

It is not proposed to discuss here the details as to death-rates, character of dwellings and of population, *etc.*, in the several districts; those who are interested in such details will find them in the special Census report referred to in the beginning of this paper. It is not possible to determine precisely the effects which faulty nutrition and insufficient shelter and clothing have upon the excessive death-rate of the poor as compared on the one hand with the effects of unclean habits, excessive use of liquor and other modes of living which are under their own immediate control to a considerable extent, and on the other hand with the effects of want of drainage, of the presence of dumping-grounds, and other unsanitary conditions in the localities which their poverty compels them to occupy; but all these things are factors in the result, and each class of these morbid influences requires different methods to secure relief or mitigation.

From this point of view, the infantile death-rates demand con-

sideration; but first a word may be said with regard to the still-births, which are reported in an excessive proportion in both cities, especially among the colored population; being in Baltimore 1.57 a thousand of population for the whites, and 3.46 for the colored; and in the District of Columbia, 1.22 for the whites, and 4.19 for the colored, annually. Out of 2,106 births reported among the colored population in Baltimore during the census year, two hundred and thirty-three, or eleven per cent, were still-births; in the District of Columbia during the same year, 2,386 births were reported among the colored population, of which three hundred and seventeen, or thirteen per cent, were still-births.

Among the whites, the percentage of still-births to total births for the census year was in Baltimore 5.7 and in the District of Columbia 5.5; in New York City it was 7.1. As the average proportion of still-births should not exceed four per cent of the total number of births—and even for illegitimate births should not be more than eight per cent—it must be considered probable that the enormous percentage of still-births reported among the colored population in Baltimore and Washington really indicates a considerable number of deaths of infants occurring within a few hours after birth and due to gross carelessness, and in some cases, it must be feared, to deliberate neglect or crime, and this would seem to be especially the case in the District of Columbia.

The death-rates of children under one year of age to each one thousand children of that age were in 1890, in Baltimore, for whites 258.6, for colored 542.6; in the District of Columbia, for whites, 207.8, for colored, 491.8. According to the English Life Table. No. 3, the average infantile death-rate is 165.6. The proper mode of computing infantile death-rates is by comparing the number of deaths with the number of births for a year, excluding still-births. Using the census figures for 1890 for this purpose, the rates are in Baltimore, for whites, 225.70, for colored, 400.96; in the District of Columbia, for whites, 186.44, for colored, 376.99. In a previous article,¹ attention has been called to the probable errors in the census figures as regards births, and the same remarks apply to the figures for the cities under consideration. In the District of Columbia, the census figures show an increase of total population of 52,768 in the ten years 1880–90, and a decrease of one hundred and twenty-seven

¹ "The Diminishing Birth-rate in the United States," *THE FORUM*, June, 1893, p. 467.

in the number of children under one year of age during the same period. According to these data, the birth-rates for the whites were in Baltimore, in 1880, 28.38, and in 1890, 25.58; in the District of Columbia, in 1880, 26.85, and in 1890, 20.98; while for the colored they were in Baltimore, in 1880, 35.46; in 1890, 27.83; and in the District of Columbia, in 1880, 38.34, and in 1890, 27.33. All these birth-rates are too low by from fifteen to twenty per cent; and the death-rates of children born are therefore too high; but they are comparable with each other unless it be assumed that the census of 1890 was more defective as regards the infants than was that of 1880. The figures as given indicate lower birth-rates and higher infantile death-rates in both cities in 1890 than in 1880; higher infantile death-rates in Baltimore than in the District; higher birth-rates among the colored than among the white; and enormously higher infantile death-rates among the colored: so that this last class of population would probably decrease in number in these cities were it not for immigration. Making all due allowance for errors in the census data, these conclusions may be accepted as correct, and they point distinctly to bad sanitary conditions in and about the homes of the colored population, which conditions have become worse in 1890 than they were in 1880.

Of the causes of death which are more or less preventable and therefore of special interest from a sanitary point of view, consumption, typhoid fever, scarlet fever and malarial fevers caused a greater proportion of deaths in Washington than in Baltimore during the six years ending June 1, 1890; while diarrhoeal diseases, diphtheria and *croup and measles were more fatal in Baltimore than in Washington during the same period. The excessive death-rate from consumption in Washington was entirely among the colored, the mortality from this cause among the whites having been greatest in Baltimore. The death-rates from typhoid fever were also greater among the colored than among the white, and greater among those of Irish parentage than among other whites. Diphtheria on the other hand was relatively more fatal among the whites than among the colored in Baltimore, the reverse being the case in Washington. The higher death-rates among the colored are largely due to poverty and ignorance; they correspond to those of the tenement-house class in New York City. Something may be done by the municipal authorities to reduce these death-rates, mainly by affording greater facilities for the preservation of cleanliness of person, clothing and habitation, and by

restricting the spread of contagious diseases by isolation and disinfection. Baltimore, as has been said, has no sewers, and hence she does not get the full benefit of her fine water-supply. Washington has sewers, but their present arrangement and outlets are unsatisfactory, and they are to be greatly extended and changed within the next four or five years in accordance with a plan prepared by a board of sewer engineers. There are still extensive areas in Washington which have neither a general water-supply nor sewers, where the water is carried by buckets from shallow wells, the slops are thrown on the ground and the excreta are disposed of in privy boxes. Of course many of these wells are polluted, and it is in these districts that diarrhoeal diseases cause the heaviest death-rates. The increase of typhoid fever in the District for the last six years, so that the death-rate from this cause has been considerably greater there than in Baltimore, is also in part due to the polluted water of these wells.

The fact that the different methods of sewage-disposal in Baltimore and Washington are not accompanied by marked differences in the death-rates is an important one which deserves careful attention by sanitarians and municipal engineers, being contrary to the prevailing opinions on this point. It seems to indicate that so long as the water-supply is pure and abundant the methods of sewage-disposal do not have much influence on the health of the community, and that while the disposal of house-slops in open gutters and the storage of sewage in cess-pools produce nuisances of various kinds, it is doubtful whether they are nuisances directly and positively injurious to health, and, therefore, their abatement should be urged on other grounds.

As regards the restriction of contagious diseases, such as scarlet fever, measles and diphtheria, by the health authorities, both cities have a system of notification of the houses in which such diseases occur, and some good is effected in this way; but the good effects of notification have been greatly limited by the fact that neither city has had a hospital to which cases of such disease, occurring in the dwellings of the poor where satisfactory isolation cannot be secured, can be sent and properly cared for. The result of this is, first, that cases of such diseases are concealed as long as possible, especially if they occur in hotels, boarding-houses, or houses above small shops; and second, that cases remain scattered about the city in places where it is practically impossible to secure satisfactory isolation. Neither city has any public disinfecting establishment, although the Health

Departments in both cities have the means of disinfecting rooms and houses in a fairly satisfactory manner.

As regards the powers of the Health Departments to suppress nuisances injurious to health, they are, theoretically, fairly sufficient for the purpose, but practically they cannot be fully exercised, owing in part to the want of means to employ a sufficient number of inspectors to ensure the enforcement of the rules and regulations with regard to stagnant water, slops, garbage, sewage-disposal, house plumbing, food, markets, *etc.*, and partly because there is not legal machinery enough to deal properly with the number of cases which would occur if all violations of the regulations were reported. This is also the case in almost all other large cities. It is by no means easy to ascertain precisely what the law is, in either city, with regard to the conditions within and near habitations which may affect the health of the inmates, for the requirements are scattered through health ordinances, building regulations, plumbing regulations, *etc.*, and much is left to the discretion of the courts, which make allowances for ignorance, poverty and surrounding circumstances.

The method of disposal of waste products is the matter in which the health department has the most frequent occasion to interfere with the liberty of the householder in order to prevent nuisance or danger to health. In Baltimore, not only all garbage and offal, but also all ashes, are removed at public expense; in Washington each householder must make his own arrangements for the removal of ashes and have it done at his own expense. In Baltimore, privy-pits are used for the reception of sewage; in Washington, boxes placed above the level of the ground are more commonly used for this purpose in the unsewered districts.

The excess of the death-rate among the whites in Baltimore over that in Washington, amounting to nearly two deaths a thousand of population annually, is probably due in part to the differences in the method of sewage-disposal in the two cities, but the evidence as to this is not conclusive. It is, however, the excessive death-rate among the colored in both cities which chiefly demands attention, and it must be confessed that there is not much reason to think any marked lowering of this death-rate can be effected by municipal engineering methods, or by legislation which can be practically enforced at present. Some improvement in the healthfulness of this class can no doubt be produced by proper sewerage, compulsory connection of houses with the general water-supply and the sewers, by soil-drainage

and the prevention of damp cellars and walls, and by proper methods of dealing with contagion; but after all this has been done there will still remain a great mortality of children, due to congenital debility, neglect, improper food, *etc.*, and also heavy death-rates from tuberculosis, pneumonia, alcoholism, and some allied causes acting upon adults. A considerable proportion of the colored population of Baltimore and Washington resembles the population of the slums and tenement-houses of Northern cities, so far as poverty, ignorance and uncleanness are concerned, but it includes fewer of the actually criminal class, and a smaller proportion of habitual tramps and vagabonds.

Whether it is possible materially to diminish the excessive death and sick rates, which are in part an effect and in part a cause of poverty, and which, like poverty, are closely connected with ignorance, indolence and vice, is one of the grave questions of the day. Especially important is the question, "To what extent and in what manner is it expedient to attempt to bring about such reduction by municipal regulations and authorities, and at public expense?" If, for example, the law fixes a standard of human dwellings as regards floor-space and cubic air space per head, freedom from dampness, amount of light, compulsory connection with general water-supplies and sewers, house-plumbing and fixtures, *etc.*, and if this standard is not below what are usually considered to be the minimum requirements for the preservation of health and of barely decent family life, then the strict enforcement of such laws in Baltimore and Washington would make it impossible for the poorer class of colored people to live in those cities at their own cost. To force them to go elsewhere, and thus increase the burdens of some other locality, is not a solution of the problem; to provide for them in institutions at public expense and allow their family life to be maintained, is impracticable.

If it be possible to solve these problems of social pathology, and of pauperism, by legal regulation in detail of the conditions of life of the very poor in any city of this country, it should be possible in Washington; but if anything of this kind is to be attempted, it will be necessary to change slowly, for great evils may be easily produced by such interference. This point will be further considered in subsequent papers dealing with the sanitary conditions of New York, Brooklyn, Philadelphia and Boston.

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